

- a. Find $g(1)$ and $f(g(1))$.
- b. Find $g(2)$ and $f(g(2))$.
- c. Find $g(3)$ and $f(g(3))$.
- d. Find $f(4)$ and $g(f(4))$.
- e. Find $g(f(3))$.
- f. Find $f(f(5))$.
- g. Find $g(g(3))$.
- h. Find $f(f(f(1)))$.

8. **Composite Function Numerically, Problem 2:** Functions u and v consist of the discrete points in the table, and only these points. Find the values of the composite functions, or explain why no such value exists.

	x	$u(x)$	$v(x)$
a. Find $v(2)$ and $u(v(2))$.	2	3	6
b. Find $v(6)$ and $u(v(6))$.	2	3	6
c. Find $v(4)$ and $u(v(4))$.	4	8	5
d. Find $u(4)$ and $v(u(4))$.	6	2	4
e. Find $v(u(10))$.	8	10	2
f. Find $v(v(10))$.	10	6	8
g. Find $u(u(6))$.			
h. Find $v(v(8))$.			

9. **Composite Function Algebraically, Problem 1:** Let g and f be defined by

$$f(x) = 9 - x \quad 4 \leq x \leq 8$$

$$g(x) = x + 2 \quad 1 \leq x \leq 5$$

- a. Make a table showing values of $g(x)$ for each integer value of x in the domain of g . In another column, show the corresponding values of $f(g(x))$. If there is no such value, write "none."
- b. From your table in part a, what does the domain of the composite function $f \circ g$ seem to be? Confirm (or refute) your conclusion by finding the domain algebraically.
- c. Explain why $f(g(6))$ is undefined. Explain why $f(g(1))$ is undefined, even though $g(1)$ is defined.
- d. Repeat parts a and b for the composite function $g \circ f$.
- e. Figure 1-4l shows functions f and g . Enter the two functions as $f_1(x)$ and $f_2(x)$. Then enter $f(g(x))$ as $f_3(x) = f_1(f_2(x))$, and $g(f(x))$ as $f_2(f_1(x))$. Plot the graphs using the window

shown, with the grapher's grid showing and thick style for the two composite function graphs. Sketch the result. Do the domains of the composite functions from the graph agree with your results in parts b and d?

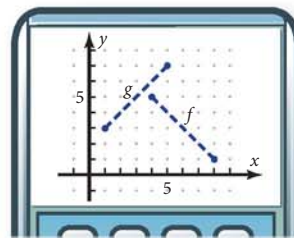


Figure 1-4l

- f. Find $f(f(5))$. Explain why $g(g(5))$ is undefined.
10. **Composite Function Algebraically, Problem 2:** Let f and g be defined by
- $$f(x) = -x^2 + 8x - 4 \quad 1 \leq x \leq 6$$
- $$g(x) = 5 - x \quad 0 \leq x \leq 7$$
- a. Make a table showing values of $g(x)$ for each integer value of x in the domain of g . In another column, show the corresponding values of $f(g(x))$. If there is no such value, write "none."
 - b. From your table in part a, what does the domain of the composite function $f \circ g$ seem to be? Confirm (or refute) your conclusion by finding the domain algebraically.
 - c. Show why $f(g(3))$ is defined but $g(f(3))$ is undefined.
 - d. Figure 1-4m shows the graphs of f and g . Enter these equations as $f_1(x)$ and $f_2(x)$. Then enter $f(g(x))$ as $f_3(x) = f_1(f_2(x))$. Plot the three graphs with the grapher's grid showing. Sketch the result. Does the domain of the composite function agree with your calculation in part b?

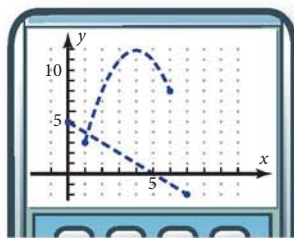


Figure 1-4m